



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Group Art Unit: 3713**

**In re PATENT APPLICATION of**

**Applicant : NABIL N. GHALY**

**Serial No. : 08/962,971**

**Filed : October 27, 1997**

**For : ELECTRONIC HAND HELD  
LOGIC GAME  
REISSUE APPLICATION OF  
U.S. PATENT NO. 5,286,037  
ISSUED FEBRUARY 15, 1994**

**Examiner : MICHAEL W. ONEILL**

\_\_\_\_\_  
May 24, 2005

**SUPPLEMENTAL REISSUE DECLARATION**

**NABIL N. GHALY declares as follows:**

1. I, Nabil N. Ghaly, a citizen of the United States of America, residing at 14 Longwood Drive, South Huntington, NY 11746, hereby declare that I have reviewed and understand the contents of my continuation application, including the specification and claims seeking reissue of U. S. Patent No. 5,286,037 (hereinafter "the '037 Patent").

2. I acknowledge the duty to disclose information that is material to the patentability of this reissue application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a). I believe that I am an original, first and sole inventor of the subject matter which is claimed in the

continuation application, and for which a reissue patent is sought on the invention entitled "ELECTRONIC HAND HELD LOGIC GAME".

3. I verily believe that the original patent is partly inoperative by reason of my claiming less than I had a right to claim in the patent, and in particular, by including, in one or more independent claims of the '037 patent, through my actions without the assistance of patent counsel, unduly restrictive limitations that are not essential nor necessary parts of my invention, and by relying entirely on independent claims that were written mostly in means-plus-function format. I also declare that all errors being corrected in the reissue application, up to the date of this supplemental reissue declaration, arose without any deceptive intention on my part.

4. The excesses and insufficiencies of the claims, which I seek to replace, the errors relied upon, how the errors, which I am seeking to correct arose, and the timeline from the moment of conception to the moment of issue, are as follows:

5. This electronic hand held logic game was conceived in November 1990, while I was experimenting with Light Emitting Diodes (LED's). At that time, I constructed a simple electronic device, which used interconnected electrical switches to activate an LED. This device was later (January 1991) expanded to activate a multi-color display using two sets of micro-switches.

6. In February 1991, I conceived the idea of using a plurality of light emitting means, and a plurality of switches to build an electronic hand held logic game. I started the construction of a 4x4, hard wired, array of multi-colored indicators to demonstrate my idea and its functionality.

7. Simultaneously with constructing this model, I started to gather information related to filing a patent application to protect my invention. Because I did not have the financial resources to retain a patent attorney in 1991, I proceeded with drafting the patent application, acting pro se.

8. In drafting my application, I relied on information provided by the patent office and on the format of patents received from the patent library in New York City. None of the information received explained the requirement of claim drafting, or how to draft a claim so that it would provide maximum protection for the invention.

9. During the period from February 1991, until August 24, 1991, I drafted and finalized my patent application including 46 claims. These claims were drafted starting on or about August 10, 1991, and were completed on August 23, 1991. Acting pro se, I did not fully understand the requirements of claim drafting and how they apply to an "invention." I erroneously believed that the independent claims must contain all the desired elements of the invention including those optional elements, which are not necessary for the basic operation of the invention. Further, I incorrectly believed that providing more details, as part of the claims, will afford me more protection for my invention.

10. In addition, I incorrectly believed that claims must be written in means-plus function format. I was unaware of the provisions of 35 U.S.C. §112, ¶ 6, which limit the coverage of a means-plus-function limitation to the corresponding structure disclosed in the specification, and its equivalent. As a result of my erroneous belief, I drafted my two original independent claims 1 & 23 relying entirely on means-plus-function limitations. Subsequent discussions with a patent attorney, and reading decisions of patent law cases, have clarified my understanding related to the use of means-plus-function limitations. I now understand that I am entitled, and it is essential, to draft my claims using both means-plus-function and structural formats. Accordingly, I have drafted my new independent claims 83 & 111 without any means-plus-function limitations. New independent claim 100 employs a number of means-plus-function limitations.

11. Furthermore, I incorrectly believed that I could disclose a corresponding structure to a means-plus-function limitation in a dependent claim rather than in the body of the specification. As a result, I erroneously disclosed in dependent claims 11 & 31, the use of keypad switches, i.e. momentary switches, to control the device, rather than making such disclosure in the specification. Accordingly, I have amended the specification to include the disclosure of keypad switches that were disclosed in original dependent claims 11 & 31.

12. Also, I incorrectly believed that I could provide technical disclosure unique to the invention in dependent claims. As a result, I erroneously disclosed in original dependent claims 8 and 28 the technical description of how to vary the number of colors or images playable by the device. I understand now that such technical description should be included in the specification, and not in dependent claims. Accordingly, I have amended the specification to include the technical description that was disclosed in original dependent claims 8 and 28, and more specifically, the disclosure that one can control the number of colors or images playable by the device by simply varying the assignment of color or display codes to a variable number of predetermined colors or images.

13. Original independent claims 1 & 23 include the limitation of **“a housing for the device.”** This limitation has been deleted from proposed new independent claims 100 & 111 herein. My invention relates to a game system independent whether the operating elements of the game are incorporated within a housing. When I drafted this claim in August 1991, I was acting pro se, and did not fully understand the requirements of claim drafting. I mistakenly thought that, as I had described the game as preferably being self-contained unit, a “housing” was a necessary part of the invention.

14. New independent claims 83, 100 & 111 delete the claim limitation of **“means for varying the level of difficulty of any particular game,”** which is included in the original independent claims 1 & 23. At the time of filing my original application (August 1991), I envisioned my invention as having the capability of play at different difficulty levels. I thus included this feature as an integral part of the definition of the game apparatus set forth in said claims 1 & 23. As with the “housing” limitation, I did not recognize at that time that this feature, although contemplated by me as being a desirable feature of the game, could properly be excluded from a definition of my “invention.”

15. In addition, new independent claims 83, 100 & 111 delete the claim limitation of **“sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to each activation of the entry control means, a plurality of sensorially perceptible and distinct indications each of which is corresponding to each of a plurality of predetermined colors being displayed at all multi-color light emitting means and a sensorially perceptible indication corresponding to the successful completion of a game,”** which was included in original independent claims 1 & 23. Similar to the limitations of “housing” and **“means for varying the level of difficulty of any particular game,”** I envisioned at the time of filing my original application that the game display would be accompanied by other indications, such as sound and visual effects to heighten the enjoyment of a game. I thus included this optional feature as an integral part of the definition of the game apparatus set forth in original claims 1 & 23. As with the aforestated two limitations, I did not recognize at that time that this feature, although contemplated by me as being a desirable part of the game, could properly be excluded from a definition of my “invention.” Subsequent

discussions with a patent attorney, and my readings of patent law cases, have clarified my understanding of the purpose, interpretation and scope of claims, and I now understand that the inclusion of such optional features were unduly limiting, as they are not a necessary requirement or feature of what I consider to be my invention.

16. In my original independent claims 1 & 23, I included the limitation **“means for generating a plurality of codes, hereinafter referred to as operating codes.”** This limitation is written in means-plus-function format. As discussed in paragraph 10, when I drafted this limitation in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Also, my intention at the time I drafted this claim was to provide a brief clarification of a first set of codes employed by the invention by using the same term “operating codes” used in the specification. I now recognize, after discussion with a patent attorney, and reading patent law cases, that adding such explanation and clarification is unduly limiting, and has resulted from my failure to appreciate my ability to claim a more generic definition for said first set of codes. Further, as disclosed in the specification and drawings the first set of codes used by the invention could be generated at random, or could also be predefined for each of the two embodiments (4x4 and 8x8) as indicated in the specification and drawings. Therefore, the term **“generating a plurality of codes”** is unduly limiting because it excludes the use of predefined codes by the claimed invention. When I drafted this limitation in August 1991, I did not fully understand the requirements for claim drafting, I did not realize that by reciting the specific function of **“generating a plurality of codes,”** I am excluding from the definition of my invention the second disclosure in the specification of using predefined codes. In addition, as indicated in the specification and drawings, each game is defined by a different assignment of said first set of

codes to the playing positions. Accordingly, in order to correct the aforesaid errors and deficiencies, my new independent claims 83 and 111 recite a structure that **“assigns a first set of binary numbers to playing positions on the playfield.”** Also, my new claim 100 includes the means-plus-function limitation **“means to assign a first set of binary numbers to playing positions on the playfield.”**

17. In my original independent claims 1 & 23, I included the limitation **“plurality of entry control means.”** This limitation is written in means-plus-function format. As discussed in paragraph 10, when I drafted this limitation in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Accordingly, in order to overcome such disadvantages, my new independent claims 83 and 111 recite the structural limitation of using a **“keypad switch,”** which was included in my original dependent claims 11 and 31. New independent claim 111, also, recites the option of using a **“cursor control switch structure”** to select and activate any playing position, in lieu of a keypad switch at each playing position. Such cursor control switch structure is well known in the art, and its use for the invention is obvious to a person of ordinary skills in electronic games in light of the disclosure in the specification that the invention could be implemented using an LCD or a CRT screen. Typically, when such screens are used in a game device, it is desirable to use a cursor control switch mechanism to select a play location on the playfield. Many of the computer games that were available at the time I drafted my patent application in 1991 employed a mouse control mechanism. Furthermore, new claim 100 recites the means-plus-function limitation, **“a control means to activate the playing position.”**

18. In my original independent claims 1 & 23, I included the limitation **“plurality of routing means defining a respective plurality of playing positions on the surface of said housing, each of said routing means being actuable by said entry control means to route said operating codes within the device.”** This limitation is written in means-plus-function format. As discussed in paragraph 10, when I drafted this limitation in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Further, my intention at the time I drafted this claim in August 1991, was to provide, as part of this claim, a brief explanation that the routing means define respective playing positions, and are controlled by the entry control means. Since I was acting pro se in August 1991, I did not fully understand the requirements of claim drafting. I mistakenly thought that I must include explanations or clarifications as part of the claim. I now recognize, after discussion with a patent attorney, and reading patent law cases, that adding such explanations and clarifications is unduly limiting. In addition, the term **“to route said operating codes within the device”** is somehow imprecise, and does not accurately describe the mechanism used by the invention. These codes are not just routed **“within the device,”** but are rather routed to each other. As indicated in the specification and drawings, upon the activation of a playing position, the codes respective to the activated playing position are routed to each other. Accordingly, in my new independent claim 83, I included the limitation of a control program executed on the processor that **“routes binary numbers respective to an activated playing position to each other.”** Similarly, I included in my new independent claim 111 the limitation of a control program executed on the processor that **“routes binary numbers respective to an activated playing position to each other.”** Also, I included in my new independent claim 100



the means-plus-function limitation, **“means to route binary numbers respective to an activated playing position to each other.”**

19. In my original independent claim 1, I included the limitation **“means to generate a plurality of codes, hereinafter referred to as color codes, from said plurality of operating codes.”** Also, in my original independent claim 23, I included the limitation **“means to generate a plurality of codes, hereinafter referred to as display codes, from said plurality of operating codes.”** These limitations are written in means-plus-function format. As discussed in paragraph 10, when I drafted these limitations in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Further, my intention at the time I drafted these claims was to provide a brief clarification of the second set of codes employed by the invention by using the descriptive terms **“operating codes,” “color codes,”** and **“display codes”** used in the specification. I now recognize, after discussion with a patent attorney, and reading patent law cases, that adding such explanation and descriptive terms is unduly limiting, and has resulted from my failure to appreciate my ability to claim a more generic definition for said second set of codes. Accordingly, I included in my new independent claims 83 and 111, the limitation of a control logic executed on a processor that **“generates a second set of binary numbers from said first set of binary numbers using a Boolean function, or a lookup table.”** The specification and drawings disclose the use of a Boolean function, or a lookup table (**FIGS. 23 & 24**) to generate the second set of binary numbers. Similarly, I included in my new independent claim 100 the means-plus-function limitation, **“means to generate a second set of binary numbers from said first set of binary numbers.”**

20. In my original independent claim 1, I included the limitation “**plurality of multi-color light emitting means.**” Also, in my original independent claim 23, I included the limitation “**means to pictorially represent a plurality of images wherein each of said plurality of playing positions is indicated to provide a plurality of display positions, each of said display positions is used to indicate any of said plurality of images.**” These limitations are written in means-plus-function format. As discussed in paragraph 10, when I drafted these limitations in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Further, I did not fully understand the requirements of claim drafting and how they apply to an “invention.” I erroneously believed that the independent claims must contain a specific desired structure, e.g., multi-color lighted switches, even though the invention could be implemented using different structures. I did not recognize at that time that this specific structure, although a desirable structure, is not essential for the definition of my “invention.” Also, my intention at the time I drafted original independent claim 23 in August 1991, was to provide, as part of that claim, a brief explanation that the images are pictorially represented and that the playing positions are used to display the images. Since I was acting pro se in August 1991, I mistakenly thought that I must include explanations or clarifications as part of the claim. I now recognize, after discussion with a patent attorney, and reading patent law cases, that adding such explanations and clarifications is unduly limiting. As explained in the specification, and as would be obvious to one skilled in the art, the invention operates with a plurality of different visual indications, such as colors or images, and it does not matter how the visual indications are produced, or what type of indicator is used to produce the visual indications. What matters is that the visual indications must be distinguishable from each other. In fact, the specification discloses various types of indicators,

including multi-color lighted switches, multi-color displays, LED displays, LCD, and CRT screens. Accordingly, I included in my new independent claims 83, 100 and 111 the recitation, **“each playing position includes an indicator that provides a plurality of visual indications.”**

21. In my original independent claim 1, I included the limitations **“means to route said color codes to said light emitting means in accordance with the determination of said routing means,”** and **“means to decode said plurality of color codes and activate said plurality of multi-color light emitting means.”** Also, in my original independent claim 23, I included the limitations **“means to route said display codes to said display positions in accordance with the determination of said routing means,”** and **“means to activate each of said plurality of display positions to provide a pictorial representation of the received display code.”** These limitations are written in means-plus-function format. As discussed in paragraph 10, when I drafted these limitations in August 1991, I was not aware of the disadvantages of relying entirely on means-plus-function limitations. Further, my intention at the time I drafted these claims was to describe detailed functions that are internal to the microprocessor that control the device. The tasks of routing data from memory locations to I/O ports, decoding data to activate indicators, and activating a display such as an LCD or a CRT screen, are internal functions provided by a microprocessor, or a micro-controller, and are not essential game features. I improperly thought at the time I drafted the application (August 1991) that all the functions of the microprocessor should be recited. I now recognize, after discussion with a patent attorney, and reading patent law cases, that reciting such internal microprocessor functions is unduly limiting, as such functions are not essential to the operation of the game. Accordingly, I included in my new independent claims 83, 100 & 111 the limitation, **“a microprocessor to control the operation of the device.”** In

addition, I included in my new independent claims 83 & 111 the limitation of a control program executed on the processor to **“assigns said second set of binary numbers to indicators on the playfield to provide visual indications.”** Also, I included in my new independent claim 100 the means-plus-function limitation **“means to assign said second set of binary numbers to indicators on the playfield to provide visual indications.”**

22. My initial method claim 42 is related to a **“method of defining and solving a logic problem in an electronic logic game.”** My intention at the time I drafted this claim in August 1991 was to describe the definition and solution of a logic problem disclosed in the specification. I erroneously believed at the time I filed my original application that a method claim related to finding a solution to said logic problem will also protect the generic steps used by the invention, which employs two sets of binary codes. In addition, I incorrectly believed at the time I drafted this method claim that providing more details in the method claim will afford me more protection. I now recognize, after discussion with a patent attorney, and reading patent law cases, that a method claim should recite the main concepts disclosed in the specification without the inclusion of unnecessary features, or details. My new method claim 126 corrects the errors and deficiencies in my original method claim 46, which resulted from my failure to appreciate my ability to draft a more generic method claim. I am also adding new software claim 127, which recites a software program embedded on a computer readable media. This software claims identifies the necessary software steps required by the invention.

23. My new dependent claims 84 through 99 emanate from new independent claim 83, and combine subsidiary elements of my invention as originally disclosed in manners, which cover various combinations thereof. Because new independent claim 83 is not written in means-plus-

function format, and since the recitation in said independent claim 83 overcomes the errors and inefficiencies present in my original independent claims, the new dependent claims 84 through 99 do not correspond one-on-one with the original dependent claims. However, said new dependent claims 84 through 99 are fully supported in the specifications, drawings, original claims, and by the understanding of a person of ordinary skills in the art.

24. New dependent claims 84, 85 & 86 are related to the use of an illuminated switch, light emitting means, and multi-color indications. The specification, drawings and original claims of the '037 Patent support the use of such structures. Original independent claim 1 recited the limitation of "multi-color light emitting means," and original dependent claim 3 recited the limitation of multi-color lighted switches.

25. New dependent claim 87 is related to the use of a CRT, an LCD, or a DLP screen to implement the indicator. The CRT and LCD indicating structures are disclosed in the specification.

26. New dependent claim 88 is related to multi-color visual indications. The specification discloses that a display could be illuminated or dark. It is obvious that when a display is dark, the visible indication is the color reflected from the surface of the display or the indicator. The invention defined by this new dependent claim 88 explains that the plurality of visual indications consists of at least one illuminated color, and the color reflected from the surface of the indicator.

27. New dependent claim 89 is related to visual indications in the form of images. Original dependent claim 26 discloses that the visual indications could be in the form of an image or a "blank" display, i.e., the absence of an image on the display. The invention defined by this

new dependent claim 89 explains that the plurality of visual indications consists of at least one image, and the visual indication resulting from the absence of an image at a playing position.

28. New dependent claim 90 is related to the optional feature of audio/visual effects (sensorially perceptible indications) generated during game play, and/or to reward a player upon successful completion of a game. The specification includes a detailed explanation of such audio/visual effects. Similar limitations were included in original independent claims 1 and 23.

29. New dependent claim 91 is related to a definition of a game, and the optional feature to generate a plurality of games. The specification includes the disclosure that a game is defined by an assignment of the first set of binary numbers to playing positions. Further, original dependent claim 9 recites the optional feature to provide a plurality of games. The invention defined by this new dependent claim 91 explains that the plurality of games is provided by varying the assignment of the first set of binary numbers to playing positions.

30. New dependent claim 92 is related to the optional feature to vary the difficulty level of play. The specification includes a detailed explanation of one example to provide different difficulty levels. Similar limitations were included in original independent claims 1 and 23.

31. New dependent claim 93 is related to providing a plurality of games that are defined by different assignments of predefined first set of binary numbers to playing positions. The specification discloses that such predefined binary numbers are program data, which is stored in the read only memory (ROM). The invention defined by this new dependent claim 93 explains that the plurality of games is stored in the data section of the control program.

32. New dependent claim 94 is related to the plurality of games recited in claim 93, and explains that such games are in various levels of difficulty.

33. New dependent claim 95 is related to an implementation of the invention that employs a three dimensional configuration. Under this implementation, the plurality of playing positions is mapped on the three-dimensional housing of the device. Such implementation was disclosed in initial dependent claim 15 of the '037 Patent.

34. New dependent claim 96 is related to the geometric configuration of the invention, and the recitation that upon the activation of a playing position, the binary numbers assigned to the playing positions at the top, right, bottom, and left of the activated position are routed to each other. This geometric configuration is disclosed in the specification and in **FIG. 1** of the '037 Patent.

35. New dependent claim 97 is related to the description of the routing square disclosed in the specification.

36. New dependent claim 98 is related to the generation of the first set of binary numbers, and recites that these binary numbers could be generated randomly. The specification supports such random generation of said binary numbers. Also, original dependent claim 10 recited the limitation of generating random codes.

37. New dependent claim 99 is also related to the generation of the first set of binary numbers, and recites that these binary numbers are predefined, and stored as program data in memory. The specification and drawings disclose a first example of eight (8) predetermined binary numbers for the 4x4 embodiment, and a second example of sixteen (16) predetermined binary numbers for the 8x8 embodiment. Because the specification considers these binary numbers as input data to the control logic program, it is implied by the specification that such input data resides in data section of said control program, i.e. the input data resides in memory.

Indeed, a person of ordinary skills in the art will appreciate that such input data normally resides in program memory.

38. Similarly, my new dependent claims 101 through 110 emanate from new independent claim 100, and combine subsidiary elements of my invention as originally disclosed in manners, which cover various combinations thereof. Because the recitation in said independent claim 100 overcomes the errors and inefficiencies present in my original independent claims, the new dependent claims 101 through 110 do not correspond one-on-one with the original dependent claims. However, these new dependent claims 101 through 110 are fully supported in the specifications, drawings, original claims, and by the understanding of a person of ordinary skills in the art.

39. New dependent claim 101 provides a housing, which as previously discussed is deemed not to be an indispensable element of the game, and thus was deleted from new proposed independent claim 100.

40. New dependent claim 102 is written in means-plus-function format, and is related to the optional feature of providing a plurality of games using the corresponding structures described in the specification.

41. New dependent claim 103 defines two alternate corresponding structures, which are described in the specification and drawings, to the means-plus-function limitation to generate a second set of binary numbers recited in independent claim 100.

42. New dependent claim 104 recites a keypad switch as a corresponding structure to the control means to activate the playing position recited in independent claim 100. As explained in



Paragraph 17, the structural limitation of using a “**keypad-switch**” was included in my original dependent claims 11 and 31.

43. New dependent claim 105 recites a cursor control switch mechanism as a corresponding structure to the control means to activate the playing position recited in proposed new independent claim 100. As explained in Paragraph 17, a cursor control switch structure is well known in the art, and its use for the invention is obvious to a person of ordinary skills in electronic games in light of the disclosure in the specification that the invention could be implemented using an LCD or a CRT screen. Typically, when a screen is used in a game device, it is desirable to use a cursor control switch mechanism. Many of the computer games that were available at the time I drafted my patent application in 1991 employed a mouse control mechanism.

44. New dependent claim 106 describes the routing square as a corresponding structure to the means to route the binary numbers to each other. Such description of the routing square is disclosed in the specification.

45. New dependent claim 107 is related to the generation of the first set of binary numbers, and recites that these binary numbers could be generated randomly. The specification supports such random generation of said binary numbers. Also, original dependent claim 10 recited the limitation of generating random codes.

46. New dependent claim 108 is related to the generation of the first set of binary numbers, and recites that these binary numbers are predefined, and stored as program data in memory. The specification and drawings disclose a first example of eight (8) predetermined binary numbers for the 4x4 embodiment, and a second example of sixteen (16) predetermined

binary numbers for the 8x8 embodiment. Because the specification considers these binary numbers as input data to the control logic program, it is implied by the specification that such input data resides in data section of said control program, i.e. the input data resides in memory. Indeed, a person of ordinary skills in the art will appreciate that such input data normally resides in program memory.

47. New dependent claim 109 recites the routing square as a corresponding structure to the means to assign the second set of binary numbers to the indicators on the playfield. A description of a dynamic assignment of said second set of binary numbers is disclosed in the specification.

48. New dependent claim 110 recites a structure based on a fixed relationship between the elements of the second set of binary numbers and the indicators, as a corresponding structure to the means to assign the second set of binary numbers to the indicators. For the 4x4 embodiment there is a total of eight (8) elements belonging to said second set of binary numbers, and sixteen (16) indicators. A person of ordinary skills in the art would immediately recognize that there exists almost infinite ways to assign 8 elements to the sixteen indicators. The structure described in dependent claim 110 simply states that the assignment remains fixed during the course of a game.

49. Further, my new dependent claims 112 through 125 emanate from new independent claim 111, and combine subsidiary elements of my invention as originally disclosed in manners, which cover various combinations thereof. Because new independent claim 111 is not written in means-plus-function format, and since the recitation in said independent claim 111 overcomes the errors and inefficiencies present in my original independent claims, the new dependent claims 112

through 125 do not correspond one-on-one with the original dependent claims. However, these new dependent claims 112 through 125 are fully supported in the specifications, drawings, original claims, and by the understanding of a person of ordinary skills in the art.

50. New dependent claim 112 provides a housing, which as previously discussed is deemed not to be an indispensable element of the game, and thus was deleted from new independent claim 111.

51. New dependent claim 113 is related to a definition of a game, and the optional feature to generate a plurality of games. The specification includes the disclosure that a game is defined by an assignment of the first set of binary numbers to playing positions. Further, original dependent claim 9 recites the optional feature to provide a plurality of games. The invention defined by this new dependent claim 113 explains that the plurality of games is provided by varying the assignment of the first set of binary numbers to playing positions.

52. New dependent claim 114 recites a structure based on a fixed relationship between the elements of the second set of binary numbers and the indicators. For the 4x4 embodiment there is a total of eight (8) elements belonging to the second set of binary numbers, and sixteen (16) indicators. A person of ordinary skills in the art would immediately recognize that there exists almost infinite ways to assign said 8 elements to the sixteen indicators. The structure described in dependent claim 114 simply states that the assignment remains fixed during the course of a game.

53. New dependent claim 115 is related to the use of light emitting means to implement the indicators, and provide the plurality of visual indications. The specification, and original claims of the '037 Patent supports the use of an emitted light based structure. Original

independent claim 1 recited the limitation of “multi-color light emitting means,” and original dependent claim 3 recited the limitation of multi-color lighted switches.

54. New dependent claim 116 is related to a multi-color display that provides multi-color visual indications. The specification discloses the use of such multi-color displays. Further, the specification discloses that a display could be illuminated or dark. It is obvious that when a display is dark, the visible indication is the color reflected from the surface of the display or the indicator. The invention defined by this new dependent claim 116 explains that the plurality of visual indications consists of at least one illuminated color, and the color reflected from the surface of the indicator.

55. New dependent claim 117 refers to the light emitting means recited in claim 115, and recites a corresponding structure that consist of a single, or a plurality of light emitting diodes at each playing position.

56. New dependent claim 118 refers to the structure defined in proposed dependent claim 117, and further recites that the light emitting diodes have different colors.

57. New dependent claim 119 is related to the use of a CRT, plasma, DLP, or an LCD screen to implement the indicator. The CRT and LCD indicating structures are disclosed in the specification.

58. New dependent claim 120 defines the plurality of visual indications to consist of a single geometric shape in different colors. Such visual indication could be illuminated or un-illuminated. This definition of the visual indications was included in original dependent claim 38.

59. New dependent claim 121 defines the plurality of visual indications. Original dependent claim 28 discloses that the visual indications could be in the form of an image or a

“blank” display, i.e., the absence of an image on the display. The invention defined by this proposed new dependent claim 121 explains that the plurality of visual indications consists of at least one visual indication produced by an image, and an additional visual indication produced by the absence of an image at a playing position.

60. New dependent claim 122 defines that the plurality of visual indications be produced by a plurality of images, and without the visual indication resulting from a “blank” display.

61. New dependent claim 123 is related to the generation of the first set of binary numbers, and recites that these binary numbers could be generated randomly. The specification supports such random generation of said binary numbers. Also, original dependent claim 10 recited the limitation of generating random codes.

62. New dependent claim 124 is also related to the generation of the first set of binary numbers, and recites that these binary numbers could be predefined, and stored as program data in memory. The specification and drawings disclose a first example of eight (8) predetermined binary numbers for the 4x4 embodiment, and a second example of sixteen (16) predetermined binary numbers for the 8x8 embodiment. Because the specification considers these binary numbers as input data to the control logic program, it is implied by the specification that such input data resides in data section of said control program, i.e. the input data resides in memory. Indeed, a person of ordinary skills in the art will appreciate that such input data normally resides in program memory.

63. New dependent claim 125 is related to an implementation of the invention that employs a three dimensional configuration. Under this implementation, the plurality of playing

positions is mapped on the three-dimensional housing of the device. Such implementation was disclosed in initial dependent claim 15 of the '037 Patent.

64. In addition to correcting the excesses and insufficiencies of the claims, I am also seeking to amend the specification and drawings by correcting certain original errors in the specification, and inserting a number of clarifying terms, phrases and paragraphs that ensure clearer understanding of the technical disclosure in the patent. The amendments set forth herein do not constitute new material, and are rather clarifications consistent with the understanding of one skilled in the art.

65. I am seeking to correct two typographical errors, namely to reflect the proper capitalization for the term "Boolean," and to replace the erroneous term "Planview" with the term "perspective view." I used the term "perspective view" in the original '037 specification at column 3, line 3 to describe **FIG. 3**. I am also replacing the term "defining" with the term "define" to correct a grammatical mistake in the specification.

66. In addition, I am seeking to delete the term "RAINBOWX" from a number of places in the specification. This term has no technical meaning, and is rather a commercial term that I used in connection with my invention. It is my understanding that such commercial description should not be included in the specification.

67. Further, I am seeking to replace the term "case" with the term "housing" in the detailed description section of the specification. The term "housing" accurately describes a housing for the device, and is consistent with the use of this term in the remainder of the specification, as well as in the claims.

68. Furthermore, I am seeking to correct an original error in the specification that describe the relationship between the maximum number of different visual indications (colors or images) and the number of playing positions. If  $N^2$  represent the number of playing positions, then the maximum number of different visual indications (colors or images) is  $N+1$  and not  $N$ . For example, in a 4x4 preferred embodiment that employs lighted indicators, the maximum number of colors is four (4) illuminated colors in addition to the color reflected from the surface of the playing position when the indicator is dark.

69. I am also seeking to insert the phrase “in the form of a lookup table” to the description of **FIGS. 23 & 24**. Each of these figures includes two tables. The first table indicates the colors generated by pairs of the first set of binary numbers (operating codes). The second table indicates the binary numbers (color codes) assigned to the various colors. This amendment does not add any new material to the specification, but rather explains that the first table in these figures is in fact a lookup table that provides the color corresponding to each pair of operating codes. Also, as part of this amendment, I am seeking to delete from the description of **FIGS. 23 & 24** the reference to the “EXCLUSIVE OR” Boolean function. While for the two examples described in the preferred embodiment, the relationship between the two sets of codes indicated in the lookup tables of **FIGS. 23 & 24** is consistent with the Boolean function described in the specification, the lookup table for other embodiment may not have a corresponding Boolean function.

70. Further, I am seeking to clarify the assignment of the first set of binary numbers (operating codes) to the playing positions. As indicated in the specification, these binary numbers are first assigned to the perimeter playing positions. However, because of the connectivity

provided by the routing squares, said binary numbers are further assigned or projected to the remaining playing positions. The specification discloses that when a playing position is activated, the four binary numbers respective to that position are routed to each other. This means that the four binary numbers respective to an activated playing position are assigned or projected to the playing positions at the top, right, bottom, and left of the activated position. This clarification is required to ensure a clearer understanding of the routing process described in the preferred embodiment.

71. In addition, I am seeking to correct an erroneous technical term used in the '037 Patent. The specification at column 6, line 35 employs the erroneous technical term "INCLUSIVE OR" to describe the Boolean function used by the preferred embodiment to generate the most significant bit (left bit) of a color code from the most significant bits of the corresponding pair of operating codes. The correct description of the Boolean function employed by the invention is "EXCLUSIVE NOR." This error was caused by my educational background, where the term INCLUSIVE OR was used to describe the truth table for the EXCLUSIVE NOR, or the COINCIDENCE Boolean function. FIGS. 18 & 20 of the '037 patent indicates the use of the "⊙" Boolean operator for said most significant bit. The "⊙" Boolean operator is known in the Boolean algebra textbooks as the "EXCLUSIVE NOR," or the "COINCIDENCE" Boolean function. Further, the truth table derived from FIGS. 23 & 24 is consistent with said "EXCLUSIVE NOR," or the "COINCIDENCE" Boolean function. Accordingly, this proposed amendment to the specification simply corrects the erroneous term "INCLUSIVE OR" by replacing it with "EXCLUSIVE NOR" to be consistent with the description in the drawings.



72. Also, I am seeking to clarify the term “multi-color display” when an illuminated indicator is used. As would be obvious to one skilled in the art, when such indicator is “dark,” the resulting visible color to the player is the external color reflected from the surface of the indicator. It is necessary to make such clarification to the specification to ensure a proper understanding of the visual indication produced by a “dark” indicator.

73. Furthermore, I am seeking to insert certain phrases to the specification to clarify how the routing square is activated when a keypad switch is used. Such clarifications were included in original claims 1 & 23, do not constitute new material, and are consistent with the understanding of a person skilled in the art. **FIGS 2a & 2b**, as well as the specification, indicate that the routing square used for the preferred embodiment has two logical states. These states are identical to the states of an associated bi-stable switch (when a bi-stable switch is used to activate a playing position). Because it is not necessary to use a bi-stable switch to activate a playing position, and since a keypad switch (momentary switch) could be used to toggle the routing square between its two states, these amendments are necessary to clarify that the state of the routing square could be used to control various functions described in the invention.

74. I am also seeking to insert a new paragraph in the specification that explains the fact that there is almost an infinite number of ways to assign the generated color codes to playing positions. While the specification describes an algorithm that assigns color codes to playing positions using the routing square, it is important to clarify that the solution to a game, where the objective is to display a single color or image at all playing positions, is independent of how the color codes are assigned to playing positions. This is the case because when a solution is reached,

by definition, all generated color codes must be identical or, in the alternative, must belong to a subset of color codes that define a single color or image.

75. As I indicated in paragraph 11 herein, I incorrectly believed that I could disclose a corresponding structure to a means-plus-function limitation in a dependent claim rather than in the body of the specification. My original claims 1 and 23 recite that the entry control means are used to activate the routing structure described in the preferred embodiment. Further, dependent claims 11, 31 and 37 state that the entry control means is implemented using a keypad switch. Accordingly, I am seeking to incorporate this original disclosure of keypad switches into the specification, and to clarify that when a keypad switch is employed, successive activations of the keypad switch toggles the routing square between its two states indicated in **FIGS 2a & 2b**.

76. Further, as I explained in paragraph 12 herein, I incorrectly believed that I could provide technical disclosure unique to the invention in dependent claims. As a result, I disclosed in original dependent claim 8 a simple process to vary the number of colors playable by a device by manipulating the assignment of color codes (second set of binary numbers) to a variable number of predetermined colors (including the color visible when an indicator is dark). Also, original dependent claim 28 of the '037 Patent describes the same process to vary the number of images displayed by the device, also, by manipulating the assignment of display codes (second set of binary numbers) to a variable number of predefined images, including the visual indication or image corresponding to a "blank" display. Accordingly, I am seeking to incorporate these original disclosures into the specification. For example, in the 4x4 preferred embodiment, there are eight (8) different color or display codes that could be assigned to 2, 3, 4 or 5 different visual

indications (i.e., colors or images). Similarly, in the 8x8 embodiment, there are sixteen (16) colors or images that could be assigned to 2 to 9 different visual indications.

77. In addition, I am seeking to amend each of **FIGS. 23 & 24**. This amendment consists of the addition of one entry to the second (bottom) table in each of these figures, which provides the binary codes corresponding to the blank or white square shown in the first tabulation. The specification at column 7, lines 56 to 57 defines the color codes for the 4x4 embodiment as the four digit binary numbers having the first bit equal to "0," i.e., the binary numbers defined as "0---," where "-" denotes the don't care value. Accordingly, the proposed amendment to these figures do not constitute new material, but rather incorporate information from the specification into the drawings to ensure clearer understanding of **FIGS. 23 & 24**.

78. Also, I am seeking to amend **FIGS. 18** to be consistent with the correction to the specification related to the maximum number of visual indications playable by the 4x4 embodiment, and the proper definition of the Boolean function employed by the invention, and represented by the "⊙" Boolean operator.

79. Having addressed the amendments to the claims, specification and drawings, I would like to provide the following chronology of the facts, events and circumstances related to prosecution history of the original patent application, and the current reissue application.

80. On or about April 29, 1992, I received the first communication from the Patent and Trademark Office setting forth the examiner's comments on my original patent application and requesting a number of modifications in said patent application and claims.

81. Upon receiving the April 29 communication, I drafted a response to address the issues raised by the examiner. My main focus at that time was to satisfy the examiner's objections so that

the claims may be allowed. Since the examiner did not raise the issue of claim limitation, I had no reason to question my incorrect understandings of claim requirement.

82. On or about July 2, 1992, I finalized my response to the April 29 communication and submitted a 13 pages letter to the Patent and Trademark Office. In my response I requested the deletion of then claims 17, 33 & 42, the additions of claims 48, 49, 50 & 51 and to make modifications to then claims 1, 15, 16, 18, 19, 20, 21, 34, 35, 36, 37, 38, 39, 40, 43, 44, 45, 46 & 47. None of these requested modifications was relevant to the scope of protection provided by a claim.

83. I received the second communication from the examiner on or about October 23, 1992. The examiner made the observation that I am not familiar with patent prosecuting procedure and recommended that I secure the services of a registered patent attorney to help me with my application. Further, the examiner made a number of objections and comments related to my application as modified by my July 2, 1992 response.

84. Following the receipt of the October 23 communication, I attempted to address the objections and comments of the examiner. However, I did not retain a patent attorney because of my limited financial resources at that time.

85. On or about January 12, 1993, I finalized my response to the October 23 communication and submitted an 8 pages letter to the Patent & Trademark Office, requesting the deletion of then claims 50 & 51 and to make modifications to then claims 43, 44, 45, 46 & 47. Since then claims 1 - 16, 18 - 32, 34 - 41, 48 & 49 were allowed by the examiner, I did not see a reason at that time to make any modifications to said allowed claims.

86. I received the next communication from the examiner on or about May 3, 1993, and I was advised that my communication of January 12, 1993, failed to comply with established format for amending claims using appropriate bracketing and underlining.

87. On or about May 15, 1993, I responded to the May 3 communication by submitting an 8 pages response to the Patent and Trademark Office using the appropriate bracketing and underlining. Since my main focus at that time was, again, to address the examiner's objections, I did not have any reason to modify or amend any claims other than 43 - 47.

88. On or about August 20, 1993, I received a Notice of Allowance and Issue Fee Due. In this communication, the examiner made a number of requirements and requested that I correct the drawings in accordance with instructions provided by her.

89. In response to the August 20 communication, I submitted a letter dated October 18, 1993, responding to all remaining objections by the examiner. As before, my focus was only directed to overcome all objections raised by the examiner. I had no reason to modify any of the claims that were previously allowed.

90. Thereafter, on or about October 27, 1993, the Office of Publications, Publishing Division received the corrected drawings.

91. Following the payment of the required fees, U.S. Patent No. 5,286,037 was issued on February 15, 1994.

92. Thereafter, in connection with my efforts to commercialize the invention, I was advised by a patent attorney that my '037 Patent is partially inoperative by reason of my claiming less than I had a right to claim in the patent. Therefore, on or about August 17, 1994, I retained

the firm of Schweitzer Cornmann & Gross (SC&G) to file and prosecute a reissue application on my behalf with the Patent and Trademark Office (PTO).

93. Thereafter, on or about January 23, 1995, SC&G filed Reissue Application No. 08/376,798. SC&G continued to prosecute this reissue application on my behalf until May 5, 1997, when a Notice of Allowance was issued in connection with said reissue application number 08/376,798.

94. Further, in June 1996, I retained SC&G to represent me against two companies, which allegedly infringed the '037 Patent.

95. Thereafter, I was advised by SC&G that it is necessary to abandon reissue application number 08/376,798 in favor of the current continuation application, which incorporates original claims of the '037 Patent. SC&G explained that the original claims are required in a reissued patent to maintain continuity of scope of coverage, and to enable me to enforce my patent rights, after the reissue, against the two companies that were allegedly infringing my original '037 Patent.

96. The current continuation application was filed on October 27, 1997, however, because of the infringement litigation, and on or about November 20, 1998, the PTO stayed any action related to the current reissue application pending a resolution of the infringement litigation.

97. Thereafter, it was brought to my attention that during the time when SC&G was prosecuting the reissue application on my behalf, and representing me in the infringement claims, SC&G was also representing my adversaries in an unrelated patent proceeding, and had a close working relationship with my adversaries' attorneys. Accordingly, on or about May 20, 2000, I discharged SC&G from representing me in the current reissue application.

98. The infringement litigation is now resolved. On or about January 16, 2005, the parties to the infringement actions executed a stipulation to resolve all differences without further recourse to litigation. Pursuant to this stipulation, I agreed not to pursue a further appeal of a judgment of non-infringement by the United States Court of Appeals for the Federal Circuit. Thereafter, on or about January 26, 2005, the United States District Court, Eastern District of New York approved said stipulation.

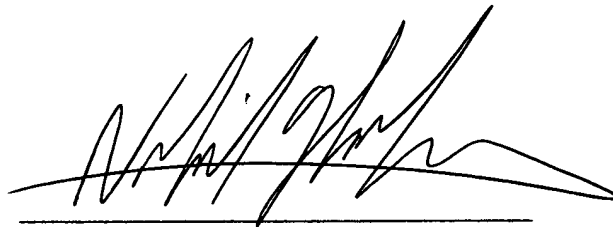
99. During the time since this current application was stayed, I consulted with a number of patent attorneys, and read a number of patent law cases, and I now understand that the claims set forth by my former attorneys SC&G in this current application fail to address all of the defects and errors in my original '037 Patent. For example, the current claims drafted by SC&G, which I am seeking to replace herein, still rely entirely on means-plus-function limitations. Further, because the infringement litigation is now resolved, there is no need to maintain original '037 claims in this application.

100. All of the foregoing defects or errors became apparent to me when I consulted with patent attorneys in connection with my effort to commercialize the invention, and during the course of the infringement litigation. I also learned of my errors by reading patent case laws. I am able now to identify the errors, and set forth the present reissue application to correct them.

I hereby declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful, false statements and the like so made are punishable by fine, or imprisonment, or both, under section 1001 of Title 18 of the United States

Code, and that such willful, false statements may jeopardize the validity of this application or any patent issuing therefrom.

Executed on May 24, 2005

A handwritten signature in black ink, appearing to read 'Nabil N. Ghaly', written over a horizontal line.

Dr. NABIL N. GHALY  
Citizen of USA  
*Postal and Street Address*  
14 Longwood Drive  
South Huntington, NY 11746  
(631) 549-0980